



# BIOCHAR COMPOST FACT SHEET

## Enhancing Composting Efficiency & Soil Health with Biochar

### Why Use Biochar in Compost?

The integration of biochar into compost enhances microbial activity, improves nutrient retention, reduces greenhouse gas emissions, and accelerates compost stabilisation.

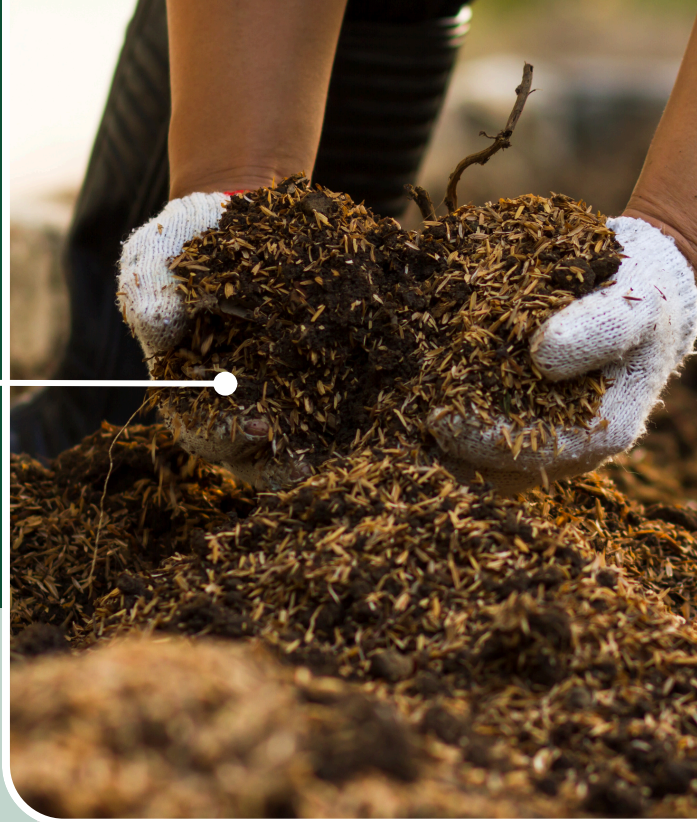
Research and case studies from the ANZBIG Farmer's Guide to Biochar indicate that co-composting with 5-10% biochar improves composting in the following ways:

- Faster breakdown of ligno-cellulosic biomass<sup>1,2</sup>
- Reduced odour<sup>1,2</sup>
- Reduced greenhouse gas emissions<sup>1,2</sup>
- Improve the compost value<sup>3</sup> via:
  - Increased plant available nutrients & WHC\*
  - Reduced nutrient leaching
  - Reduced loss of nitrogen
  - Increased carbon sequestration

\* WHC: water holding capacity

### Recommended Application Rates

- **General Composting:** Add 5-10% biochar by volume at the start of composting
- **High-Nitrogen Composting (e.g., manure):** Use up to 15% biochar to stabilize nitrogen
- **Field Applications:** Apply biochar compost at 5-10 tons per hectare based on soil conditions



### How Biochar Benefits Composting

#### Enhanced Microbial Activity

- High surface area and porosity provides a variety of habitats for beneficial microbes and increases aeration<sup>1</sup>.
- Increased abundance of lignocellulose-degrading thermophilic bacteria e.g. *Solibacillus* & *Actinobacteria*<sup>2</sup>.

#### Reduced odour emissions

- Straw biochars are particularly good at adsorption of ammonia<sup>2</sup>. Biochar particle size 4-10 mm
- reduces methane emissions from compost piles<sup>2</sup>.

#### Nutrient Increase & Soil Remediation

- Straw biochars increase NH<sub>3</sub> & NH<sub>4</sub><sup>+</sup> adsorption (up to 36% more N) and potassium<sup>2</sup>.
- Wood biochar in a biosolids-straw compost increased fulvic and humic acid fractions<sup>4</sup>.



# Case Studies from ANZBIG Farmer's Guide

## 1. Western Australia – Salt-Affected Soil Remediation<sup>1</sup>

**Challenge:** Severe soil salinity impacting plant growth and soil health.

- **Solution:** Integrated biochar into compost-filled reactive wells and trenches with organic amendments.
- **Results:** Reduced soil salinity, improved microbial activity, enhanced plant growth, and better water infiltration.

## 2. California – Vineyards Applications<sup>1</sup>

**Challenge:** Soil moisture retention and organic matter improvement.

- **Solution:** Applied biochar-compost mix at 7 tons per hectare. **Results:**
- Improved vine growth, 20% higher yield, and better water-use efficiency.

## 3. Portland, U.S. – Green Roofs and Urban Agriculture<sup>1</sup>

**Challenge:** Enhancing water retention, nutrient availability, and runoff quality in green roofs and urban gardens.

- **Solution:** Integrated 7% biochar by weight into rooftop soil beds with composts, organics and pumice: improved water storage, reduced nutrient runoff, and enhanced plant growth.
- **Results:** Increased water retention (up to 100%), improved nutrient cycling, reduced runoff pollution (nitrogen, phosphorus, and heavy metals), and enhanced fire resistance in urban green spaces.

## Biochar-Compost for best results

- Incorporate biochar at the beginning of composting for best results<sup>5</sup>
- Use standard compost spreading equipment for even field application.
- Adjust biochar levels based on crop and soil requirements.
- Biochar composting:
  - improves yields & long-term soil health
  - sustainably manages organic waste.

### References and Further Reading:

1. Joseph S. & Taylor P (2024). A farmers guide to the production, application and use of biochar, ANZBIG.
2. Melo L, et. al. (2024). Biochar-based fertilizers, co-composting, and growing media. In: Biochar for Environmental Management, Lehmann J. and Joseph S. (eds), Routledge (Taylor and Francis).
3. US Biochar Initiative. Biochar in compost: Improve compost and save money. biochar-us.org.
4. Zhang J et al. (2014). The use of biochar-amended composting to improve the humification and degradation of sewage sludge. Bioresource Technology 168: 252.
5. Mikajlo I et al. (2024). Composted biochar versus compost with biochar: effects on soil properties and plant growth. Biochar 6: 85.

**Join ANZBIG today & download a free digital copy of 'A Farmers Guide to Biochar' @ [anzbig.org](http://anzbig.org)**

